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SITUATION REPORT - CALIFORNIA MEDITERRANEAN FRUIT  
FLY PROGRAM - SEPTEMBER 4, 1981

SUMMARY

Prospects are now considered favorable for the successful eradication of the Mediterranean fruit fly infestation in California. Aerial application of malathion bait, currently covering 1200 square miles, is showing results. During earlier stages of the eradication program, when release of sterile flies was the primary eradication tool, a number of technical difficulties may have hampered eradication efforts. In USDA's opinion, difficulties in identifying "native vs sterile flies" masked a continuing infestation, and a relaxation of quality control procedures may have led to accidental release of some fertile flies. In a "worst case" situation, the impact of an accidental release of some fertile flies would have been minimal.

BACKGROUND

A cooperative U. S.-California effort to eradicate an infestation of Mediterranean fruit flies commenced in June 1980 when two fertile flies were found in San Jose, California. Until July 10, 1981, the cooperative program relied on a program of regulation, sterile fly releases, fruit stripping, and ground treatments. (See attachment for chronology of events.) Sterile flies used in the program were obtained from Mexico, Costa Rica, Hawaii, and Peru.

As the program progressed, a number of difficulties were identified. Trapping disparities, logistical problems and general conservatism in the committee-type management decisions made by the cooperating parties probably contributed to underestimating the problem in its early stages. By November 1980 it was clear that the infestation was greater than could be handled by available sources of sterile flies. Although aerial treatment had been repeatedly proposed by USDA, and agreed to in November by the California Department of Food and Agriculture, the Technical Review Committee instead recommended a milder approach of fruit stripping and ground treatments.

Although USDA announced plans for an aerial pesticide treatment program on December 5, 1980, public and local officials rejected the plan. Instead, the Governor invoked emergency powers on December 24 and announced a fruit stripping and ground treatment program that mobilized 2,000 State and Federal employees for a 2-month period in early 1981.

Spring warming would show if this approach was effective. In any event, some flies that had overwintered as pupae were anticipated. But emerging flies were all females, a fact entomologists had difficulty explaining. However, in other infestations in other years, the finding of only females has indicated the near end of the infestation. Some final mopping up and eradication appeared imminent.

Washington, DC, USDA APHIS, 1981.

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CATALOGING - PREP.



On June 18, a trapped yellow-dyed fly was found to be fertile; the yellow dye should have indicated a sterile fly from Peru. Subsequently, a second fertile Peruvian fly was found.

On June 26, a homeowner reported larvae in backyard fruit. After positive identification of Medfly was made and announced, other reports by individuals came in; and additional fruit collections were made by program personnel--all revealed Medfly larvae.

#### THE FLY PROBLEM

In recent weeks there have been a number of references made to fertile Peruvian flies being the cause of the June finds and the July-August expanding infestation. There appear to be several explanations for this program reversal, with fertile Peruvian flies being the least likely.

#### Misidentification-Probably the Basic Problem

Identification (sterile vs native flies) procedures may have masked a continuing infestation. As many as 130,000 flies per day were being received by the laboratory for identification. Headpunching (squashing)--the original method for confirming the presence of colored dye added to flies to denote sterility--became too time consuming. In early 1981, USDA's Agricultural Research Service provided an alternative method--approved by project management to make these identifications under blacklight. The method called for the picking out of all dyed flies from the traps so that fertiles or suspect flies could be subjected to further examination.

Two problems occurred with this method:

First, with so many flies in traps (up to 200 in a single trap), co-mingling of dyed and native flies occurred frequently. Dye could rub off on native flies, causing them to be identified as sterile in the identification process.

Second, and more importantly, the Medfly has a natural green fluorescence of its own. Since Hawaiian source sterile flies were dyed green, native flies could be, and apparently were, mistaken for the green-dyed flies.

These identification problems were recognized in June and a test was run. To determine identification accuracy, wings were clipped on one hundred sterile, but nondyed Medflies from Hawaii; they were placed 10 to a trap in 10 traps. Identifiers should have reported 100 suspect flies since they were not dyed. In fact, they identified only 6 of the 100 as being native. Ninety-four were missed.

It is likely that misidentification of fertile flies had been occurring for several months, masking the true size of the infestation. The reduced accuracy of native fly detection probably contributed to underestimating the infested area and distorted interpretation of results of the winter's stripping and treatment efforts.



### Quality Control Unsatisfactory

On review, quality control procedures used were questionable. Protocol for checking of each batch of flies received from contract sources as outlined in the "Joint Cooperative Mediterranean Fruit Fly Eradication Project Manual," dated February, 1981, calls for 25 flies to be sterility-checked out of each shipment container (roughly 190,000 flies) received from Peru.

Because the program began to receive in excess of 100 million flies weekly, the workload of the Quality Control section increased substantially. After discussion by State and Federal program leaders and with full knowledge of project management, the number of flies sampled for quality control was reduced. In practice, only one fly per container was actually tested for sterility.

### Fertile Flies from Peru

It appears some fertile flies were released in the San Jose area. It is impossible to specify the exact number of fertile flies released accidentally. However, in a worst case situation, a single canister (54,000 pupae) may not have been sterilized before shipment from Peru.

It has been determined that from one canister probably no more than 6,750 fertile flies could have been introduced into an environment which in this case was already saturated with overwhelming numbers of sterile flies (see calculations below).

54,000 pupae per canister
X 50% emergence (a high for Peru)
=27,000 emerged flies
X 50% females (capable of producing offspring)
=13,500
X 50% loss due to predation, unsuccessful mating, climatic extremes
= 6,750 with potential to mate with fertile males

It is unlikely that all 6,750 females would have mated successfully with fertile males. Any fertile flies released were accompanied by massive numbers of sterile flies and also became part of an existing large sterile population; there was a much greater likelihood of their mating with sterile males.

In addition, the Peruvian flies in question were released over 10 grid areas in the aerial release sector. Larval infestations were found later in over 47 grid areas between June 26 and August 17--a far greater area than that in which the Peruvian flies were released. Dissections of other Peruvian flies released at the same time and caught in other traps revealed all were sterile. To date, checks of over 2,000 Peruvian flies caught in traps at the same time have turned up only the two fertile insects--a ratio of more than 1,000-to-1. This ratio of steriles to fertiles far exceeds the 100-to-1 ratio ordinarily used to eradicate the Medfly.



## CURRENT SITUATION

Depending on the area, anywhere from one to seven treatments of malathion/bait material have been applied aerially to infested areas. Treatments are on a 7-day schedule and are being carried out efficiently and effectively.

Since the original core area has received the most treatments, fly finds have dropped to the point where an occasional fly is being found along the periphery of the treated area. Unless new finds dictate later treatments, program officials plan to continue treating in the core area until about the first of November.

In the San Joaquin Valley infestation, three applications have been made and no further flies or larvae have been found since September 3. The aerial application program on over 1200 square miles is showing excellent results.

Only four small, localized outbreaks have been found outside the three "core" infested counties (Santa Clara, Alameda, and San Mateo). All four are attributable to artificial spread by individuals illegally taking Medfly contaminated fruit out of the quarantined area. Similar incidents occurred during previous Medfly outbreaks in Florida and Texas. Considering the large amount of backyard-grown host fruits in, and traffic flow through, the three core quarantined counties, it was to be expected that some artificial spread would occur.

Currently, all or part of 7 California counties are under State and Federal quarantine. The counties include Santa Clara, Alameda, San Mateo, Santa Cruz, San Benito, Stanislaus and Los Angeles. More than 3,000 square miles are regulated.

### Technical Advisory Committee Changed

The Technical Advisory Committee (TAC) was recently restructured to include a larger number of scientists knowledgeable about Medfly. The 15 member group also has representatives from other States as well as a scientist from Mexico. This TAC recently developed new guidelines for taking regulatory action based on the magnitude of the infestation and to replace guidelines in the Medfly contingency plan.

### Trapping

Some 28,000 traps are in operation within the treatment area with an increased density of traps within a 100 mile circle of the Santa Clara valley. A minimum of 5 traps per square mile are in place in rural and urban areas of the remainder of the State where Medfly host occur. This trapping already array and the frequency with which the traps are serviced assures that any new outbreak will be detected quickly.



## BUDGET

USDA will continue to contribute on an equal basis with California to those costs associated with trapping, quarantine and spraying activities. California's and USDA's costs for FY 81 are not as yet determined.

## EXPORTS TO JAPAN

After lengthy negotiations, both in this country and Japan, USDA and Japanese Ministry of Agriculture, Forestry and Fisheries officials reached an agreement (August 25) on conditions under which Japan will accept shipments of California produce:

a) Japan will not accept any produce from areas of California regulated for Medfly.

b) Produce from outside the regulated areas of California will be accepted when accompanied by a phytosanitary certificate--indicating it has been treated voluntarily by the exporters to fulfill specifications stipulated by the importer. The Japanese will also require certificates of origin for the produce.

c) Fruits and fruit-type vegetables will be accepted in Japan if the produce is certified to have originated outside California and have been transported across California in sealed containers. Effective September 3, the Department began issuing phytosanitary certificates for such shipments.

Negotiations with the Japanese are continuing on which fruits and vegetables are to be considered hosts of the Medfly and on the acceptability of different treatment methods.

Animal and Plant Health Inspection Service



September, 1981

CHRONOLOGY OF  
MEDITERRANEAN FRUIT FLY PROGRAM  
SAN JOSE, CALIFORNIA

June 5, 1980	Two male Medflies recovered in San Jose, Santa Clara county
July 11	Six million sterile pupae received for ground release (Costa Rica source)
July 17	State quarantine established
July 21	First pupae shipment received from Hawaii
July 29	Federal quarantine established
August 1	First aerial release
August 6	First pupa received from Metapa, Mexico facility
August 8	The Technical Advisory Committee (TAC) recommended the use of bait spray, but limited its use to one spray in conjunction with the use of sterile flies because it would kill too many sterile flies. An aerial pesticide program was recommended by USDA, but rejected.
August 13	State Quarantine expanded from 105 square miles to 450 square miles
November 20	The TAC agreed there was a serious shortage of sterile flies. Also discussed again, was the use of aerial spraying. USDA strongly urged going forth with aerial treatments. Instead, TAC recommended postponing aerial spraying in favor of intensified ground spray and fruit stripping.
November 26	First shipment of sterile pupae from Peru received. (First 5-6 shipments were ultimately fumigated rather than being released since transportation system was being worked out. Quality of first shipments poor in general.)
December 2-18	Met with nine city councils and the public in proposed treatment areas to obtain approval for aerial application. Nearly all rejected the plan.
January 9, 1981	Massive fruit stripping program began by the State of California in 50 square mile core area. Received first shipment of sterile pupae from CDFA facility in Hawaii.
February 5	Fruit stripping by State completed in 50 square mile area. Ground treatments continued.
April-June	Adult flies found, all female. Assumed to be emerging overwintering population.
June 26	Larvae reported by Mountain View homeowners (unstripped and untreated neighborhood)



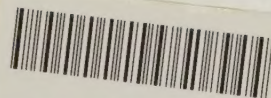
July 8 TAC unanimously recommended aerial treatment program. Governor rejected aerial spray in favor of ground spray and fruit stripping, and intensified regulatory operations.

July 10 Governor and California officials agreed to begin aerial spraying.

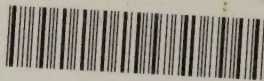
July 14 Aerial spraying begun, using helicopters.

July 18 Sterile fly releases discontinued (Total released: 4.1 billion)





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